

论文

# 一种新的结合非下采样Contourlet与自适应全变差的图像去噪方法

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摘要

该文提出了一种新的结合非下采样Contourlet变换(NSCT)和自适应全变差模型的图像去噪方法。首先通过NSCT对含噪图像进行分解,根据高斯比例混合(GSM)模型建立图像模型;然后利用贝叶斯估计进行图像去噪,重构后得到初次去噪图像;最后,结合自适应全变差模型对初次去噪图像进行重构滤波,得到最终的去噪图像。实验结果表明,该方法可以有效地消除图像中的Gibbs伪影及噪声,在去噪图像峰值信噪比(PSNR)和边缘保持性能上都优于已有的算法。

关键词 [图像处理](#) [非下采样 Contourlet变换](#) [自适应全变差](#) [高斯比例混合模型](#)

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## A New Image Denoising Method Combining the Nonsubsampling Contourlet Transform and Adaptive Total Variation

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Abstract

This paper presents a new image denoising scheme by combining the NonSubsampled Contourlet Transform (NSCT) and adaptive total variation model. The original image is first decomposed using NSCT and the image model is built based on Gaussian Scale Mixtures (GSM) model. Then the image noises are removed using Bayesian estimation, producing the preliminary denoised image after reconstruction. Then the preliminary primary denoised image is further filtered using the adaptive total variation model, producing the final denoised image. Experiments show that the proposed scheme can remove Gibbs-like artifacts and image noise effectively. Besides, it outperforms the existing schemes in regard of both the Peak-Signal-to-Noise-Ratio (PSNR) and the edge preservation ability.

Key words [Image processing](#) [NonSubsampled Contourlet Transform\(NSCT\)](#) [Adaptive total variation](#) [Gaussian Scale Mixtures\(GSM\) model](#)

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